Chemical Warfare . . . Fighting Off the Invasion in Your Forest

By *Jimmie Cobb*, Forestry & IVM Sales Specialist, Dow AgroSciences, LLC

There has been a lot written on the coming invasive weed invasion, but for much of Alabama, "The Invasion" is already here. Kudzu, privet, mimosa, Japanese honeysuckle, and others are common throughout the state. Cogongrass, Japanese climbing fern, bush honeysuckle, and others are invading parts of the state. What can a private landowner do to combat this invasion, and the growing threat of new invaders?

I am a Registered Forester and Certified Arborist who has been working in the herbicide industry for 30 years. I understand forestry herbicides and their uses very well, and understand the growth and identification of native and non-native invasive species. I battle them on my property, and want to share some of the processes I use.

When deciding what product to use, you must first consider the species to be controlled and the desirable species you do *not* want to harm. If the target vegetation is growing in an open field with no grazing and no desirable trees around, the decision of what herbicide to use is easier than if the target is growing under oaks in a hardwood bottom.

Useful ways you can generally classify the herbicides include: 1) has residual soil activity or not; 2) has foliage activity only; 3) can be used for basal bark treatments; 4) can be used under your desirable trees; and 5) can be used in aquatic or wetland areas. Keep in mind that some herbicides may have more than one of these characteristics.

Some products that are very effective on invasive species have long soil residual activity. This long-term activity helps make them effective, but they cannot be used under or around most desirable trees. These include Tordon® and Spike®. Arsenal®, Escort®, Habitat®, and Velpar® can be used around certain pines, but can damage many hardwoods and some pines by soil activity. Others with soil residual can have very specific activity; for example, Milestone® VM and Transline® can be used under most trees, except desirable legumes such as redbud. Transline can be sprayed over the top of most trees, except legumes.

Foliage active-only products can be used to control most invasives, and can also be used under and around desirable species. These products include Accord®, Garlon®, and Krenite®. Garlon 4 Ultra and Forestry Garlon XRT are ester products that have some volatility, and can damage closely adjoining vegetation when it is hot and the wind is calm.

Choosing which herbicide to use can also be tough because herbicide labels cannot list all of the species that they control. Often invasive weeds are new and limited in scope, so the companies have not updated the label. The internet, state and federal publications, as well as herbicide manufacturers and distributors are good sources to consult for product effectiveness. The vast majority of herbicides used in Alabama to combat invasives are shown in the accompanying table.

Once you decide which product to use, you must decide how to apply it. When doing silvicultural work such as site preparation or release work on a timber stand, try to get a herbicide application that will also control any invasive species on the tract. Many landowners enjoy doing their own applications. I personally get enjoyment and exercise while walking and spraying or cutting not only problem invasives, but also troublesome natives such as poison oak and greenbrier.

Application tools include tractor sprayers with booms or handguns; four-wheelers with booms, boomless nozzles, or handguns; power sprayers that can be mounted on pickups; and backpack and hand-held sprayers. The booms and boomless broadcast nozzles are good for grass, broadleaf, and very short brush problems.

Gasoline powered or electric powered handgun sprayers are very useful for spot treating invasive weeds and combating vines such as kudzu and wisteria. Products are generally recommended as a percent solution to apply in these situations. For high volume guns putting out 75+ gallons per acre, you need a lower percent solution than an electric gun that will only put out about 25 gallons. High water volumes are very useful when spraying kudzu with Tordon, Milestone VM, Escort, or Transline. Most brush species can be controlled equally as well with a low concentration herbicide solution sprayed to totally wet the target, or a higher concentration sprayed to apply a fine mist covering most leaves. Using the low volume rate with high volume equipment can be costly!

Photo by Mike Kyser

Backpack sprayers are very useful tools in fighting invasives. In addition to the adjustable cone and small fan nozzles that come with most backpacks, you can add wand extensions and booms that allow you to broadcast-spray brush and weeds that are up to 8 feet tall. Extend the wand 3 to 4 feet and hold it up and pointing behind you, and you can treat swaths of up to 15 feet wide effectively. Use a wide angle flat fan or flood jet nozzle for this application.

I think most people in the invasives fighting business are familiar with foliage applications, but some other useful application techniques include basal, cut stump, injection, and soil banding or pellets. In a basal application, the lower 12 to 15 inches of bark are treated with an oil and herbicide mix. You can treat stems up to 6 inches in diameter. The treatments can be applied year round, but winter applications are very effective; working conditions are usually great, and grass and weeds do not interfere as much with application. Most invasive trees and shrubs can be controlled by this treatment, including privet, tallow tree, silverthorn, ailanthus, and others. Garlon 4 Ultra is the most used herbicide for this treatment, and it is applied at 20 to 25% concentration in a basal bark oil or diesel oil. There is also a ready-to-use product available called Pathfinder® II that is very handy for smaller jobs.

Most herbicides that are used for foliage spray can also be used for cut stump or injection treatments. If you are removing stems of invasive trees or shrubs, you should treat the stumps. Immediately after cutting, you can use a water-soluble herbicide such as Accord, Roundup®, Arsenal, Garlon, or Velpar for treating the cambium area of the cut stump. Check the label for dilutions, usually 25 to 50%. Pathway and Milestone VM Plus are used undiluted on fresh-cut stumps. With water-soluble herbicides, the sooner after cutting the stump is treated, the better your results. If you want to treat cut stumps more than an hour after cutting, use the basal products listed above, and apply to the cambium and bark along the edge of the stump. For injection, cut into the stem about ½ inch deep with a hatchet or machete, and squirt the herbicide into the "cup" formed by the cut. The cut stump and injection treatments work year round, except during strong sap flow periods in the spring.

Certain herbicides with a lot of soil activity, such as Spike and Velpar, may be applied in soil spots, bands, or by pellet applications. These products should not be used near any desirable trees and shrubs. They are highly soil-active, which makes them useful for the soil banding or spot treatment, but they will also control or injure anything with roots in the treated area. The applications should be made in the winter or early spring where they can be moved into the soil for root uptake. For fence rows with privet and other problems, Spike can be banded or applied by pellets for long-term control. Individual stems can be treated with spots applied around the stem. Consult the label for use rates. Spike is also effective on kudzu patches in areas away from trees, and can be broadcast for control.

On my creek bottomland, privet, silverthorn, and Japanese climbing fern have been the most troublesome species. I am spraying under large oaks, pines, beeches, sweetgums, and other hardwoods, so most of my applications are limited to products with no soil activity. My initial treatments on the privet were foliar applications of Accord in the late fall and early winter. This lets me kill the privet, but not harm deciduous hardwoods growing around the privet. After reducing the density with Accord, I have followed up on escapes with basal treatments of Garlon. As the birds drop seeds that sprout, I spray the privet seedlings with Garlon or Accord, or pull them up.

The silverthorn is a nasty, thorny evergreen with numerous stems. Basal Garlon applications are controlling this. The birds drop new seeds, and foliar Garlon treatments on the seedlings, or machete, are working very well. Japanese climbing fern is spreading down the creek banks, and foliar applications of Accord have been good for control.

I have gotten the invasive species down to a very small number, but birds and other animals, wind, and water continue to bring them back to me. I am getting my neighbors involved, and trying to reduce the re-invasion while enjoying my creek bottom woods.

Herbicide Use Decision Tree

Product	Controls Broadleaf Weeds	Controls Grass	Controls Brush & Trees	Has a Soil Residual Activity	Foliar Active	Basal Bark Use	Injection & cut surface	Can be used Under Trees	Aquatic label	"Dry" Wetland Label	Allowed in grazed areas(1)
Accord® Conc., Rodeo	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y(1)
Accord XRT II, Roundup	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y(1)
Arsenal®	Y	Y	Y	Y	Y	N	Y	P*	N	Y	Y(1)
Milestone® VM	Y	N	S	Y	Y	N	N	Y*	N	Y	Y
Escort® XP	Y	N	S	Y	Y	N	N	P*	N	Y	Y(1)
Garlon® 4 Ultra & XRT	Y	N	Y	N	Y	Y	Y	Y	N	Y	Y(1)
Garlon 3A	Y	N	Y	N	Y	N	Y	Y	Y	Y	Y(1)
Habitat®	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N
Krenite®	Y	N	Y	N	Y	N	Y	Y	N	Y	N
Plateau®	Y	Y	N	Y	Y	N	N	Y	N	N	Y(1)
Spike® 20P, Spike 80DF	Y	Y	Y	Y	N	N	N	N	N	N	Y(1)
Tordon® K, Tordon 101	Y	N	Y	Y	Y	Y	Y	N	N	N	Y(1)
Transline®	Y	N	S	Y	Y	N	Y	Y*	N	N	Y(1)
Velpar®	Y	Y	Y	Y	N	N	Y	P*	N	N	Y(1)

Velpar, Krenite, Escort Trademark of DuPont
Arsenal, Habitat, Plateau are Trademarks of BASF
Roundup is a trademark of Monsanto
Accord, Rodeo, Garlon, Milestone, Pathway, Spike, Tordon, Transline, Pathfinder are trademarks of Dow AgroSciences

Y Controls a broad range of species in the category, or fits well in the category description
N Does not control a broad range of species in the category, or does not fit the category description
S Controls or suppress some species in this category
* Do Not Apply Under Desirable Legumes. Appears selective for other species, but testing still being done.
(1) many products have restrictions, check for specific grazing restrictions on each product label
P* Can be used under certain pine species at some rates